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ABSTRACT

In 1995, Merritt College, in Oakland, California, conducted telephone interviews with 23 hazardous waste generating businesses and 30 environmental professionals in the San Francisco Bay Area to determine interest in receiving training from the college related to waste management and areas of training needed. An analysis of responses revealed the following: (1) 83% of the responding waste-generating businesses handled hazardous waste, with two-thirds reporting that they required permits; (2) with respect to these businesses' training needs, worker health and safety was the most cited area of greatest importance, while access to regulations, environmental cleanup, hazardous waste management, recycling, and managing wastewater discharges were also cited; (3) most of the waste-generating businesses preferred one-on-one education, while 4- to 16-hour day or evening classes and ongoing, onsite training also received support; (4) smaller waste-generating companies primarily expressed interest in learning overall compliance regulations in a hands-on setting, while businesses of all sizes were interested in training to reduce the cost of compliance; (5) for the 30 environmental professionals, 60% served more private than public clients; and (6) 66% of these professionals expressed a need for information on soil vapor extraction and 40% were interested in environmental design. Appendixes include the waste-generators and environmental professionals survey instruments, with tabulated responses, and a list of sources used to determine the survey sample. (TGI)

ED 392 499

ENVIRONMENTAL TECHNOLOGY TRANSFER NEEDS OF BAY AREA BUSINESS AND ENVIRONMENTAL CONSULTANTS

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Produced by B C. Associates Consultants, Berkeley, CA and
Merritt College Environmental Sciences Department, Oakland, CA
for Pierre Thiry, Ph D , City College of San Francisco, on "Environmental Technology and DOD Technology Transfer," funded by U S Department of Defense

Our special thanks to Catherine Cheesix, Charles Ford, Mike Malachowski, Norma Silver, and Pierre Thiry for valuable suggestions.

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SEPTEMBER, 1995

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SUMMARY

In the summer of 1995, fifty-three (53) waste generating businesses and professional environmental firms were interviewed regarding their potential interest in receiving community college training in several technologies. The technologies were developed in the process of military base closings in the San Francisco Bay Area.

The smaller waste generating companies primarily expressed interest in learning overall compliance regulations for their sites in a hands-on setting. The environmental consulting firms showed the highest interest in learning soil vapor extraction techniques, as well as Geographic Information Systems (GIS) general environmental science and environmental design.

Purpose of Survey:

This survey of San Francisco Bay Area hazardous waste generating businesses and environmental professionals was conducted to inform three area community colleges about needs they may have with which they can provide information about hazardous materials technologies to local businesses. The technologies were developed in the process of clearing and remediation of the Alameda Naval Air station, with the purpose of disseminating these technologies to local businesses, professionals and government. The survey was designed to determine which technologies should be delivered to whom and by what methods.

Type of Survey:

The survey, which was conducted July and August of 1995, consisted of two separate questionnaires. The respondents were first contacted by phone and responded by either phone interview or by fax. One questionnaire included 24 questions, and was aimed at hazardous waste generating businesses which might be interested in technical training curriculum modules offered them through community colleges. The second survey, which targeted environmental professionals, consisted of a series of five questions asked by telephone. These respondents were asked about their interest in learning more of the specific technologies being developed during the Alameda Naval Air Station site remediation process. (See Appendix 4, p. 14.)

Sample Universe:

The sample group was selected from waste generators and environmental remediationfirms in Alameda County, the City of San Francisco, San Francisco peninsula, and southern Bay Area. A variety of smaller companies and a few very large manufacturers were chosen.

Source lists were compiled from government contractors, permit holders, technical college advisors, the telephone directory, and entities known to the survey staff, including minority and woman-owned businesses. (See Appendix 7, p. 19)

Rates of Response:

Approximately 100 companies were contacted, of which 53 responded. About one quarter of the calls were made to businesses known to be owned by women or minorities. This latter category yielded 10% of the responses.

NARRATIVE DESCRIPTION OF WASTE GENERATORS (COHORT #1) RESPONSES

23 RESPONDENTS TOTAL

I COMPANY INFORMATION

(A) & (B) The sample consisted of very small companies, a few mid-sized, and about 1/5 very large employers. 74% of the sample companies had fewer than 50 employees, most having fewer than 10 employees (52% of total). 17% were very large employers with employment numbers in the thousands.

II HAZARDOUS MATERIALS

1) 83% of the respondents handle hazardous materials, which reflects the intentional selection of potential waste generators.

2) 2/3 of the companies require permits for their hazardous materials.

3) Worker health & safety was by far the most cited area of greatest importance. Access to regulations, environmental cleanup, hazardous waste management, recycling of materials, and wastewater discharges were the second most cited by about half. This group was followed half again by Environmental Data Management, energy conservation and lead abatement. Finally, after another 50% drop came air emissions, restoration of habitat, land use planning and pesticide use and storage.

   These data would seem to correlate with what would be expected from the sample selection of small and non-smokestack waste generators in urban areas.

4) Almost all of the responding companies have a person who is primarily responsible for environmental compliance matters.

5) Even though 22% of the respondents require air emission permits, fewer than half of these cite air emissions as area of importance, however

6) 35% of the respondents require water discharge permits. 66% of these regard waste water as an important concern. A consistent pattern of interest regarding air and water emissions is not clear from the data collected. It is possible that this may gain significance with further study.

7) 74% of the companies produce hazardous wastes which must be disposed of.

8) About half have equipment or vehicle repair facilities.

9) 74% report having a hazardous materials management or emergency response plan.

10) 57% recycle or reuse hazardous materials such as solvents, photographic chemistry, laboratory chemicals, oil, coolant, batteries, tires and metal printing plates.

11) Less than 25% the businesses are involved in clean up or restoration of a contaminated site.

III RESTORATION LANDSCAPING

12) Only 10% are involved with restoring wetlands, however,

13) three times report needing information on wetlands and storm water management

IV ENERGY

14) Only 30% of the respondents have had an energy audit on their buildings or operations. Of these, 70% were carried out in-house or privately and 30% by PG&E. About 35% (slightly higher than had audits) felt they would benefit from an audit, 26% did not know if they would benefit. These data suggest 60% of the respondents might be candidates for learning more about energy saving possibilities.

15) The 30% of respondents that had had an energy audit had done an energy retrofit.

16)The same number have had a retrofitting estimate.

17) 35% believe they would benefit from an audit. 40% believe they would not benefit, 25% are not sure.

V LEAD ABATEMENT

18) & 19) 74% of the companies operate in buildings newer than 1950 and 35% plan to remodel.

20) About half of the business cohort are aware of abatement procedures.

VI ELECTRONICS

21) 13% of the companies perform metal plating and finishing, but none of these report serious problems with waste/rinse water lines.

VII TRAINING AND EDUCATION

22) Most respondents preferred one on one education, this was followed by an expressed interest in an educational brochure. Four to 16 hour day or evening classes or conference/workshop both had about half the support of one on one education. Ongoing and on-site training and evaluation were also suggested formats.

23) 40% of the companies would be willing to nominate someone to serve on a committee to help design a training. (See Appendix 10, P. 34)

PROBLEMS RECORDED

24) 65% cited problems related to these issues (in order of frequency):

1) Keeping up with regulations
2) Cost
3) Training
4) Encouraging pro-active environmental policy

CORRELATIONS AND ACCURACY

The responses were internally consistent, suggesting that respondents were knowledgeable. For instance, the number of respondents who report generating hazardous materials, as well as having a person responsible for management, and having a hazardous materials management plan, correlate well with each other. They add up to about 75% of the total.

65% report requiring a permit, and 43% operate vehicle or equipment repair shops, most of which generate hazardous materials. However, fewer than 75% of the generators report recycling or re-using their hazardous materials.

Where the percentages do not total 100%, the question was not answered by all the respondents.

CORRELATION OF SIZE ANDTYPE OF BUSINESS TO TYPE OF TRAINING WANTED

There was relatively even distribution between the size of the business and the range of types of delivery. The preferences did not seem to change with the business size.

CORRELATION OF REMODEL PLANS TO BUILDING AGE AND ENERGY AUDIT OR RETROFIT

Of those companies which plan to remodel, 66% have post 1950 buildings and half have had an energy audit.

NARRATIVE DESCRIPTION OF THE ENVIRONMENTAL PROFESSIONAL (COHORT #2) RESPONSES

30 RESPONDENTS TOTAL

Sixty percent (60 %) of the professional environmental firms serve more private clients than public clients. The remaining 40% serve either public clients or are evenly mixed between public and private.

One third (33%) operate only in the Bay Area, one fourth (25%) in the western U.S., and 2/5 either nationally or worldwide. They deal primarily with remediation and site assessment, with some providing consulting and compliance services.

Fifty-six percent (56%) of the professional respondents use computerized modeling now.

Two-thirds (66%) of those interviewed would like information on soil vapor extraction. More than half are interested in General Environmental Science and Geographic Information Systems, with 40% interested in Environmental Design.

About one-third to one-fifth of the respondents also expressed interest in information about marsh restoration, internal audit/tracking/reuse of materials, creek restoration, lead abatement and energy conservation. (See Appendix 5, P. 15)

CONCLUSIONS

WASTE GENERATORS (COHORT #1)

Most of the companies interviewed showed a high interest in worker health and safety. They had the required hazardous waste and emergency management plans in place. They also all had at least one person designated to handle their compliance requirements.

However, the small businesses generally find the compliance regulations unclear and subject to change. Both small and large businesses found costs and training to be problems. They also commented that it was a problem engaging management or suppliers in proactive environmental management beyond simple compliance.

Most businesses are in newer buildings, one-third plan to remodel, and 60% either feel an energy audit is useful or aren't sure. These businesses might be an audience for an energy program. The few which operate older buildings are aware of lead abatement requirements.

Those small generators who cannot hire an in-house professional or are not likely to hire a consulting firm seem most in need of keeping abreast of environmental regulations which affect their operations.

All sizes of businesses would like to reduce the costs of compliance, and need help in training. Many are willing to help design the training. Most businesses would like a chance to talk to someone individually about their particular conditions, and would like to be able to keep a brochure or handbook. Otherwise they are fairly evenly divided in terms of the type of workshop or class, as long as it is longer than three hours and less than 40 hours. Their preference is in the 4 - 16 hour range, on site and hands-on.

Most do not seem to be aware of cost savings which can come from waste minimization, re-use, and energy conservation, though they do want to reduce environmental costs.

These responses suggest that a series of several half day workshops held at waste generator sites and on-going, perhaps annual refresher courses would meet the needs of the largest number of respondents. These workshops would need to focus on compliance regulation explanation and updates. Cost reduction through waste process planning minimization, re-use and energy conservation should prove a useful addition to what most responding small businesses have access to at present. The workshop exercises could be to analyze or profile the participants' own business, and then discuss them. Such an exercise would provide the one to one benefits requested, but in the more financially feasible group setting.

For those needing more training, these business environmental compliance workshops can be connected to the more comprehensive Environmental Technologies and Environmental Sciences programs.

ENVIRONMENTAL PROFESSIONALS (COHORT #2)

A number of the specific technologies made available in the closing of Alameda Naval Air Station were of interest to environmental professionals. It is these firms which would be able to use them for their clients. The small businesses, of course, are not equipped to use them themselves, and the large manufacturers have in-house environmental professionals. These in-house Environmental Departments should also be included in the professional cohort for purposes of offering classes, although they were interviewed as generators. Like the waste generators, the professional group might also benefit from on-site demonstration labs, in addition to lecture classes. These can, of course, be offered simply in the order of stated preference, with soil vapor extraction first. Second, there is also a general interest in Environmental Science , Environmental Design and GIS. Ecological restoration, computer energy auditing, and internal auditing and re-use were also mentioned as interests by some of the respondents, but perhaps not enough to offer as special courses for them.

APPENDIX 1

ENVIRONMENTAL TECHNOLOGY DOD TECH TRANSFER

TELEPHONE QUESTIONNAIRE - 7/18/95

The purpose of this survey is to assist you with any problems you may have concerning hazardous materials and processes. All of your company information will be held in the strictest confidence, and will not be released to anyone without your specific written approval. A grant to conduct this survey is provided by the Department of Defense to Bay Area community colleges, with the purpose of transferring technology from local base closures to assist relevant Bay area businesses. (Community colleges can provide courses and workshops tailored to your company's needs.)

I. COMPANY INFORMATION

A. Which of the following general categories best describes the nature of your business/agency?

A) Agriculture
B) Commercial (Sales, Transport)
C) Governmental/Schools
D. Industrial (Mfg., Petro)
E. Services (R&D, Eng/Const dry cleaning, auto repair, auto body, furniture refinish)
F. Other _____

B. What is the total number of employees at your facility?

A) 1 - 10
B) 11 - 50
C) 51 - 100
D) 101 - 500
E) 500+

C. How many employees in your company/agency frequently work with hazardous materials?

A) 1 - 5
B) 6 - 10
C) 11 - 15
D) 16 - 25
E) 25+

II. HAZARDOUS MATERIALS

1. Is your business involved in handling or controlling hazardous materials in any way, including materials you generate or use? ___ Yes ___ No

2. Does your company require permits to handle any hazardous materials?
___ Yes ___ No. ___ Don't know___

3. Indicate areas of greatest importance or need to your company:

A. Environmental Cleanup
B. Worker Health & Safety
C. Pesticide Use & Storage
D. Environmental Data Mgt.
E. Access to Regulations
F. Land Use Planning
G. Hazardous Waste Management
H. Air Emissions
I. Recycling of Materials
J. Restoration of Habitat
K.Wastewater Discharges
L. Energy Conservation
M. Lead Abatement
N. Other _____

4. Does your company have a person who is primarily responsible for environmental compliance matters? ____ Yes ____ No

5. Does your company have sources of air emissions which require permits? (i.e.spray paint booths, gasoline dispensing) ____ Yes ____ No

6. Does your company have sources of water discharges which require permits? (i.e. process wastewater, parking lots, industrial sewer discharge) ____ Yes ____ No

7. Does your company produce hazardous wastes which must be disposed of? (i.e. waste oil, cleaning solvents, lab waste, contaminated soil) ____ Yes ____ No

8. Does your company operate vehicle or equipment maintenance shops or areas? ____ Yes ____ No

9. Does your company have a hazardous materials management plan or emergency response plan? (i.e. a plan required by County or City ordinances) ____ Yes ____ No

10. Does your company recycle or reuse any hazardous materials or wastes? ____ Yes ____ No If yes, what are they? _____

Does your company re-use the same materials? ___ Yes ___ No

11. Is your company involved in a cleanup or restoration of a contaminated site? ____ Yes ____ No

III. RESTORATION LANDSCAPING

12. Are you involved in or responsible for marsh or wetlands remediation, restoration, or management? ____ Yes ____ No

13. Do you need information regarding wetlands and stormwater management? ___ Yes ___ No

IV. ENERGY

14. Have you had an energy audit on your building(s) or operations? ____ Yes ____ No If yes, was it done by PG&E or a private firm? _____

15. Are you engaged in or have you done an energy retrofit? (i.e. lighting, heating, air conditioning, operations) ____ Yes ____ No

Page 3

16. Have you been given an audit or retrofit estimate? ____ Yes ____ No

17. Do you think you would benefit from an audit? ____ Yes____ No ____ Don't know

V. LEAD ABATEMENT

18. Does your company operate in a facility built before 1950? ___ Yes ___No What age building do you use? _____

19. Are you or do you plan to remodel? ____ Yes ____ No

20. Are you aware of the methods required to reduce hazards of removing older lead based paints? ____ Yes ____ No

VI. ELECTRONICS

21. Does your company perform any metal-plating and finishing? ___ Yes ___ No. If yes, does the rinsewater/wastewater on your lines cause you any serious problems? ____ Yes ____ No

VI. GENERAL QUESTIONS

22. For your convenience, indicate what type of training and time frame best suits your company's/agency's needs for hazardous materials compliance training?
A) 4, 8, or 16 hours, day or evening
B) One-on-One
C) Conference or workshop
D) Brochure
E) Other_____

23. Would your company be interested in nominating a person to serve on a community college advisory committee to help design a training program for hazardous materials technicians? ____Yes ___ No

24. What do you perceive to be your most difficult business problem related to these issues?

_____

_____

Thank you for taking the time to respond to this survey.

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APPENDIX 2

COHORT #1

ENVIRONMENTAL TECHNOLOGY DOD TECH TRANSFER WASTE GENERATORS RESULTS

TELEPHONE QUESTIONNAIRE DATA

(Number of Responses listed first, followed by percent of total responses. Surveys completed N=23)

The purpose of this survey is to assist you with any problems you may have concerning hazardous materials and processes. All of your company information will be held in the strictest confidence, and will not be released to anyone without your specific written approval. A grant to conduct this survey is provided by the Department of Defense to Bay Area community colleges, with the purpose of transferring technology from local base closures to assist relevant Bay area businesses. (Community colleges can provide courses and workshops tailored to your company's needs.)

COMPANY INFORMATION

A. Which of the following general categories best describes the nature of your business/agency?

A) Agriculture 0, 0%
B) Commercial (Sales, Transport) 0, 0%
C) Governmental/Schools 1, 4%
D. Industrial (Mfg., Petro) 3, 13%
E. Services (R&D, Engr./Const dry cleaning, auto repair,auto body, furniture refinish) 10, 43%
F) Other_____ 9, 7%

B. What is the total number of employees at your facility?

A) 1 - 10 12, **52%**
B) 11 - 50 5, **22%**
C) 51 - 100 1, **4%**
D) 101 - 500 1, **4%**
E) 500+ 4, **17%**

C.How many employees in your company/agency frequently work with hazardous materials?

A) 1 - 5 12, 52%
B) 6 - 10 2, 9%
C) 11 - 15 1, 4%
D) 16 - 25 0, 0%
E) 25+ 5, 13%
None 3, 13%

HAZARDOUS MATERIALS

1 Is your business involved in handling or controlling hazardous materials in any way, including materials you generate or use? 19, 83% Yes 4, 17% No

2 Does your company require permits to handle any hazardous materials?
15, 65%Yes 5, 22% No 1 Don't know 1 N.A.

3 Indicate areas of greatest importance or need to your company (in order of importance)

1. B. Worker Health & Safety, 14, 60%
2. E. Access to Regulations, 9
3. A. Environmental Cleanup, 7
3. G. Hazardous Waste Management, 7
4. I. Recycling of Materials, 6
4. K. Wastewater Discharges, 6
5. L. Energy Conservation, 4
5. D. Environmental Data Mgt., 4
6. M. Lead Abatement, 3
7. H. Air Emissions 2

7 J Restoration of Habitat 2
7 F Land Use Planning 2
8 C Pesticide Use & Storage 1
8 Other: 1

4 Does your company have a person who is primarily responsible for environmental compliance matters? 18, 78% Yes; 5, 22% No

5 Does your company have sources of air emissions which require permits? (i.e.spray paint booths, gasoline dispensing) 6, 26% Yes 17, 74% No

6 Does your company have sources of water discharges which require permits? (i.e. process wastewater, parking lots, industrial sewer discharge) 8,35% Yes 15,65% No

7 Does your company produce hazardous wastes which must be disposed of? (i.e. waste oil, cleaning solvents, lab waste, contaminated soil) 17,74% Yes 6,26% No

8 Does your company operate vehicle or equipment maintenance shops or areas? 10,43% Yes 12,52% No

9 Does your company have a hazardous materials management plan or emergency response plan? (i.e. a plan required by County or City ordinances) 17,74% Yes 6,26% No

10 Does your company recycle or reuse any hazardous materials or wastes?
13,57% Yes 10,43% No If yes, what are they?
oil, solvents, batteries, photo chemicals,lab chemicals, tires, coolant, metal plates
Does your company re-use the same materials? 1, 4% Yes No

11 Is your company involved in a cleanup or restoration of a contaminated site?
5, 22%Yes 18,78%No

RESTORATION LANDSCAPING

12. Are you involved in or responsible for marsh or wetlands remediation, restoration, or management? 2,9% Yes 21,91%No

13. Do you need information regarding wetlands and stormwater management?
7,30% Yes 15,65% No 1,4% N.A.

IV. ENERGY

14. Have you had an energy audit on your building(s) or operations? 7,30% Yes 16,70% No If yes, was it done by PG&E or a private firm? 2 PG&E, 5 private or in-house

15. Are you engaged in or have you done an energy retrofit? (i.e. lighting, heating, air conditioning, operations) 7,30%Yes 14,61% No 2, 8% N.A.

16. Have you been given an audit or retrofit estimate? 6,26% Yes 14,61% No 3,13%

17. Do you think you would benefit from an audit? 8,35%Yes 9,39% No 6,26% Don't know

V. LEAD ABATEMENT

18. Does your company operate in a facility built before 1950? 4.17%Yes 17.74%No What age building do you use?

_____

19. Are you or do you plan to remodel? 8.35%Yes 15.65% No

20. Are you aware of the methods required to reduce hazards of removing older lead based paints? 11.48%Yes 12.52%No

ELECTRONICS

21. Does your company perform any metal-plating and finishing? 3.13% Yes 19.83% No. If yes, does the rinsewater/wastewater on your lines cause you any serious problems? Yes 3.13%

TRAINING/EDUCATION

22. For your convenience, indicate what type of training and time frame best suits your company's/agency's needs for hazardous materials compliance training?
B) One-on-One
D) Brochure
A) 4, 8, or 16 hours, day or evening
C) Conference or workshop
E) Other

_____

23. Would your company be interested in nominating a person to serve on a community college advisory committee to help design a training program for hazardous materials technicians? ___ Yes ___ No

See Appendix 10, P. 34

24. What do you perceive to be your most difficult business problem related to these issues?

Thank you for taking the time to respond to this survey

APPENDIX 4

ENVIRONMENTAL TECHNOLOGY DOD TECH TRANSFER

SURVEY QUESTIONS TO ENVIRONMENTAL CONSULTANTS

NAME OF COMPANY _____

ADDRESS OF CO _____

_____

PHONE AND FAX _____

NAME & POSITION OF INTERVIEWEE _____

1. WHO DO YOU SERVICE? _____

_____

_____

2. IN WHAT REGION(S)? _____

_____

3. WHAT ARE YOUR COMPANY'S AREAS OF EXPERTISE (DISCIPLINE)?

_____

_____

4. ARE YOU DOING COMPUTERIZED MODELING? ___ YES ___ NO

_____

5. WOULD YOUR COMPANY LIKE INFORMATION (WORKSHOPS, COURSE MODULES) ON ANY OF THE FOLLOWING TOPICS?

- G I S _____
- MARSH RESTORATION _____
- ENERGY CONSERVATION _____
- SOIL VAPOR EXTRACTION _____
- INTERNAL AUDIT & TRACKING & RE-USE _____
  - WASTE MINIMIZATION _____
- CREEK RESTORATION _____
- GENERAL ENVIRONMENTAL SCIENCE _____
- ENVIRONMENTAL DESIGN _____
- LEAD ABATEMENT _____
- OTHER _____

Thank you for participating in this survey.

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APPENDIX 5

COHORT #2

ENVIRONMENTAL TECHNOLOGY DOD TECH TRANSFER RESULTS

Surveys Completed=30

1. WHO DO YOU SERVICE?
   - Mostly private 10, 46.7%
   - Mostly public 17, 56.7%
   - Private=Public 3, 10%

2. IN WHAT REGIONS?
   - Bay Area 11, 33%
   - California and Western U.S. 7, 23%
   - All U.S.A 6, 20%
   - Worldwide 6,20%

3. WHAT ARE YOUR COMPANY'S AREAS OF EXPERTISE (DISCIPLINE)?
   - Remediation 12, 40%
   - Site Assessment 10, 33%
   - Consulting 4, 13%
   - Compliance 4, 13%

4. ARE YOU DOING COMPUTER MODELING?
   - Yes 17, 56%
   - No 13, 43%

5. WOULD YOUR COMPANY LIKE INFORMATION (WORKSHOPS, COURSE MODULES) ON ANY OF THE FOLLOWING TOPICS?

   1. General Environmental Science 17,57%
   2. G.I.S. 16,53%
   3. Environmental Design 12,40%
   4. Lead Abatement 11,27.5%
   5. Marsh Restoration 10,33%
   5. Internal Audit and Tracking and Re-Use 10,33%
   5. Creek Restoration 10,33%
   6. Energy Conservation 6,20%

APPENDIX 7

List of Sources for Surveyed Businesses:

Port of Oakland Construction Contractors and Truckers, certified vendors as of March 8, 1995

Port of Oakland Commodities and Services, certified vendors as of March 8, 1995

Port of Oakland Certified Professional Services, certified vendors as of March 8, 1995

Alameda County Environmental Health Services HAZ-OPS

EHMT Vocational Program Advisory Committee membership list

Mailing list of 400 air quality permit holders in Alameda County

Blake Huntsman at H & H Ecoprises (two lists from unidentified sources)

Oakland, Alameda, Berkeley, San Leandro Yellow Pages, "Environmental and Ecological Services"

Notice of Omission

Appendices 3,6 and 8-12 were not included due to confidential content.